Investigating the Role of Contract Enforcement and Financial Costs on the Payment Choice: Industry-Level Evidence from Turkey

Kemal Türkcan and Veysel Avşar

Akdeniz University, Antalya International University

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Kemal Türkcan[2] and Veysel Avsar[3]

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Abstract: This paper examines the effect of legal and financial conditions on the payment contract choice by empirically testing the predictions of Schmidt-Eisenlohr's (2013) model with actual bilateral industry level trade finance data (at 2-digit level) from Turkey. Our results show that an improvement in contract enforcement and an increase in the financing cost in the importing country (exporting country) increases (decreases) the share of post-shipment sales. For the share of pre-payment sales, the opposite effects are estimated. Finally we find that share of post-shipment sales (pre-payment sales) increases (decreases) in the number of products traded between partners in the past.

Keywords: Method of Payments, Trade Finance, Contract Enforcement, Financial Costs, Post-Shipment, Pre-Payment, Turkey.

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[2] Türkcan: Akdeniz University, Department of Economics, Antalya, Turkey. Tel: +90 (242)-310-6427; Email: kturkcan@akdeniz.edu.tr.
[3] Avşar: Antalya International University, Department of Economics, Antalya, Turkey. Tel: +90 (242)-245-0000; Email: veysel.avsar@antalya.edu.tr.

1. Introduction

Trade finance is the lifeblood for international trade. More than 90% of cross border transactions are underpinned by some form of financing, mainly short-term credit (Auboin, 2007). Following the financial crisis in 2008-2009, survey reports show that this credit has become more expensive and that global trade experienced a substantial decline in consequence.[4] G20 countries agreed to implement $250 billion trade finance support for two years to boost the credits available to firms in 2009. Scholars have paid utmost attention to this issue and many studies explored the link between financial conditions and trade especially in the post-crisis era [including, but not limited to Greenaway et al. (2007), Muuls (2008), van der Veer (2010), Amiti and Weinstein (2011), Chor and Manova (2012), Manova (2013)].

Trade finance is broadly defined as the methods and instruments designed to support exporters and importers throughout the trade cycle (Menichini, 2009). Apart from financing, trade finance mechanisms help exporters and importers to mitigate or reduce their risks associated with doing business internationally. Serving the global marketplace brings many limitations and risks to the firms that they may not have on the domestic side. Trading firms have to pay ongoing trade costs (tariffs, freight, etc.) and challenge a set of cross country differences in economic conditions, culture, political and legal factors. Further, they face many uncertainties in executing their transactions such as currency and credit risks. In any form of trade, the most important thing is to get paid in full and on time for the seller and to receive the goods as specified for the buyer. There is a high degree of incomplete information between trading partners when engaging in cross border trade, and thus an appropriate method of payment has to be chosen in order to minimize the default and non-delivery risks.

Trade finance offer a range of payment mechanisms that enable exporters to obtain secure and timely payment from importers while enabling the importers to obtain the shipment of goods as stated in the contract. Generally, there are four common methods of payment for international transactions: OA (OA), CIA (CIA), letter of credit (L/C) and cash against documents (CAD).[5] Each of the four payment methods have different risk levels and

[4] See IMF-BAFT (2009) and Baldwin (2009).
[5] For more detailed information on the methods of payment in international trade, see ITC (2009) and ITA (2012).

provides a different level of protection to exporters and importers. In an OA sale, the shipment takes place before the payment is due, whereas the payment is received before the delivery under CIA transactions. Offering OA terms makes an exporter competitive in the international market but brings substantial default risk. CIA method, on the other hand, removes the above noted risk, however the exporter can lose its market share to its counterparts which offer more attractive financing options. Between these two extremes, banks also offer L/C or CAD to prevent the risk of default and non-delivery between the exporter and importer, provided that all terms and conditions as specified in the L/C or CAD have been fully met.

Although trade finance performs a wide range of functions in facilitating international transactions, this paper primarily focuses on the payment aspect of trade finance.[6] As emphasized by Auboin and Engemann (2013), the focus on the payment contract choice in international trade is a novel approach to understanding the structure and functioning of the trade finance market, and their role and impact on trade flows in times of financial crisis because that understanding can help policy-makers to take appropriate policy actions and measures in a timely fashion to mitigate the impact of the financial crisis on the trade finance markets, which in turn limits the negative effects of financial crisis in the future. While the literature convincingly points out the importance of the essential linkages between trade finance and trade flows, both theoretical and empirical research on the payment contract choice in trade flows remain limited. [7]

As noted by Auboin and Engemann (2013) and Love (2013), the main limitation to explore the different types of trade finance and their determinants is that detailed actual data on payment methods in trade transactions is very little. The available information is mainly derived from the surveys.[8] Schmidt-Eisenlohr (2013) derives a theoretical model to address the trade-off firms have between three different payment forms in international trade and the cross country differences in their use. The main novelty in this paper is the fact that the

[6] Trade finance performs four basic functions in facilitating international transactions: financing, risk mitigation, payment facilitation, and the provision of information about the status of payments or shipment (ITC, 2009).
[7] Several recent studies have analyzed the choice between different payment modes including Glady and Potin (2011), Ahn (2011), Mateui (2012), Schmidt-Eisenlohr (2013), Antras and Foley (2013), Olsen (2013) and Niepmann and Schmidt-Eisenlohr (2013).
[8] See for example ICC (2009), Malouche, (2009a) and IMF-BAFT (2009).

formal model predicts the financial and legal conditions in both the source and the destination country as the determinants of the cross country difference in trade finance

For an abridged description of the model, consider two risk-neutral importing and exporting firms that play a one shot game where the exporter makes a take it or leave it offer to the importer. This proposal specifies not only the price and quantity but also the type of the payment in the particular transaction. In this setting, there are two problems arising: a financing problem stemming from the time gap between the delivery and payment; and a commitment problem because of the advanced financing by one of the trading partners. Under OA (CIA), exporter (importer) has to finance the transaction using her country's financial system. As per the commitment problem, contract enforcement takes place in the importer's (exporter's) country if the OA (CIA) method is chosen. Financing by the firm in the country with lower financing costs and weaker enforcement maximizes the exporter profit. Therefore, if contract enforcement in importer's (exporter's) country strengthens, OA (CIA) becomes more attractive. In terms of financing costs, exporters (importers) in countries with less financing costs will be more willing to execute the transaction via OA (CIA) terms.

Using data on bilateral trade flows of 150 countries over the period 1980-2004, Schmidt-Eisenlohr (2013) indirectly tests the predictions of the payment contract choice model by aggregate gravity regressions and finds evidence that, as predicted, financial conditions and contract environments both in exporting and importing country matter for trade. In particular, the empirical results show that countries with higher financial costs trade less with each other and the size of this effect increases as the geographical distance between trading partners, a proxy for time to trade, increases.

Hoefele et al. (2013) takes a further step and directly test the predictions of the model utilizing the World Bank Enterprise Survey data for firms from 54 developing countries over the period between 2006 and 2009. The main disadvantage of this survey is that it does not break down the information on OA sales into domestic and international, even if it documents the share of exports in total sales. Antras and Foley (2013) use the data for a single large US exporter and this study, to our knowledge, is the only one which employs actual data in this line of research. Their findings suggest that exports to more distant countries and countries with weak enforcement are more likely to occur on CIA terms or L/C

terms. They also show that the use of post-shipment method (OA) increases as the relationship between trading partners improves.[9]

Although conceptually related, our paper brings significant improvements over the above noted previous work. First, the detailed Turkish two-digit industry data provides not only the trade volumes in each industry but also the volume of exports shipped under different payment terms.[10] This allows us to test the theoretical model of Schmidt-Esienlohr (2013) not only for post-shipment transactions but also for pre-payment. Second, the data reports the destination markets, which allows us to work with a balanced panel for industry-export market pairs. This feature of the dataset paves the way to analyze the effect of legal and financial conditions both in Turkey and in the particular trading partner. In this regard, our study represents the first attempt to investigate payment choice in international trade using three-dimensional (industry-destination-year) bilateral export data.[11]

Hence, given the growing role of trade financing in trade flows and a lack of sufficient quantitative evidence, this paper aims to fill this gap in the literature by investigating the effect of legal and financial conditions on the payment contract choice using a unique bilateral trade finance data from Turkey at the 2-digit level of ISIC Revision 3. Turkey, especially considering the post-2000 period, is a particularly useful starting point for our investigation. From 2002 to 2012, in particular, Turkey's exports have increased almost fivefold from 30.9 billion US dollars to 138.4 billion US dollars.[12,13] With respect to the extensive margin, the Exporter Dynamics Database of the World Bank shows that the number of exporting firms increased from 30,000 to 48,000 and the number of exporters per export destination increased from 500 to 1000 between 2002 and 2010.[14] The number of export markets with an export volume over 1 billion USD increased from 5 in 2000 to more

[9] In addition to the aforementioned studies, some works have explicitly dealt with only one method of payment in great detail, namely L/C (see Glady and Potin, 2011; Niepmann and Schmidt-Eisenlohr, 2013).
[10] Very few countries (e.g. Brazil, India, Italy, Korea and Turkey) provide sufficient country-level trade finance data on a bilateral basis covering the whole economy (Malouche, 2009a and BIS, 2014).
[11] Notable exceptions are the studies by Malouche (2009b), Demir (2014) and Demir and Javorcik (2014).
[12] Source: Authors' own calculations based on UN COMTRADE database at the 6-digit level of 1996 Harmonized System.
[13] See Figure 1.
[14] For instance, Aldan and Çulha (2013) provided evidence that Turkey has successfully diversified its exports by products and destination markets during the period 2003-2011.

than 30 in 2010. [15] In addition to all these points, share of top 10 markets in Turkey's total exports decreased from 62 percent in 2000 to 48 percent in 2010. Overall, Turkey is a suitable country for the analysis on types of trade finance not only because of the disaggregated data but also because of the increase in its ties with global markets and the pattern of diversification in its exports over the period of our sample.[16]

Our main findings can be summarized as follows: an improvement in the enforcement and an increase in the financing costs in the importing country (exporting country) increases (decreases) the share of post-shipment sales.[17] For the share of pre-payment, the opposite effects are estimated for the enforcement and financing costs. Finally, share of post-shipment sales (pre-payment sales) increases (decreases) in the number of more products traded between partners in the previous year. The last finding points out the importance of developing a relationship and building trust in terms of choosing the appropriate payment method in cross border trade.

The rest of the paper is organized as follows. The second section describes the data and its sources and provides key findings and trends on the usage of payment methods in Turkey across income groups, regions as well as industry groups. In section 3, we describe our econometric model. Section 4 reports the empirical results. Finally, we conclude in Section 5.

2. Data and some patterns

TURKSTAT's database on methods of payments in Turkish exports, which contains detailed bilateral data in terms of trade finance instruments for over 270 countries (including the free-trade zones) classified according to the International Standard Industrial Classification of All Economic Activities (ISIC, Revision 3) at the 2-digit level was used to investigate the empirical validity of the Schmidt-Eisenlohr's (2013) theoretical model. Data availability in TURKSTAT's database spans from 2002 to 2013. Beside free trade zones, we

[15] These are approximate numbers.
[16] Turkey's spectacular export performance over the years is mainly driven by the increasing participation of Turkish companies into the global value chains in recent years (Kaminski and Ng, 2006; Saygılı and Saygılı, 2011; and Gros and Selçuki, 2013).
[17] OA and CAD are classified as post-shipment, whereas CIA and L/C is classified as pre-payment.

exclude some countries from our analysis, often due to the absence of trade or changes in political boundaries. Thus, bilateral trade finance data from Turkey with 206 countries over the period 2002-2012 at the 2-digit level of ISIC Revision 3 was used in the empirical analysis.

This unique database documents the total amount of exports data using a specific payment method in value (in thousands of US dollars at the current prices) and in quantities (where quantities are reported in different units of measure, such as kilograms, meters, liters, square meters, and such like) at the 2-digit level of ISIC Revision 3. Many different types of payment methods exist in the database and types vary greatly from year to year. In order to make a consistent analysis from year-to-year, these are grouped into five main categories*:* OA, CIA, CAD, L/C and other. In carrying out the study, we restrict ourselves to manufacturing industries belonging to ISIC divisions 15-37, but excluding recycling (ISIC 37). [18] Furthermore, in order to shed some light on the usage of trade finance instruments across industry groups, we have classified the manufacturing industries into four categories according to their technological intensity: low-technology, medium-low-technology, medium-high-technology and high-technology, based on OECD's Technology classification of manufacturing industries.

The industry data is matched with two cross-country data. First, for the contract enforcement, we used the rule of law index obtained from *t*he World Bank Worldwide Governance Indicators. As noted in Glady and Potin (2011) and Schmidt-Eisenlohr (2013), this index is a convenient proxy for the quality of contract enforcement, property rights and courts. Second, following Glady and Potin (2011), Hoefele et al. (2013), the financial costs are proxied by the net interest margin which is the net interest income of the banks relative to their total earning assets. Alternatively, we also employed private credit over GDP to proxy the general financial development as a robustness check. Both variables come from the World Bank Global Financial Development Database.

Finally, we utilized the World Bank World Development Indicators for GDP per capita and United States Department of Agriculture's website for exchange rate. The number

[18] Table A1 documents the list of industries.

of exported products within industries was obtained from the United Nations Commodity Trade Statistics Database (UN Comtrade), which contains data for over 5,000 items at the Harmonized System's (HS, Revision 1996) six-digit level. The first lag of this variable is used to measure the level of past trading relationship which improves the trust between parties by reducing the informational barriers. We manually constructed this variable by summing up the total HS six-digit products within the industry exported to a particular export destination.

Table 1 documents the average use of each payment method between 2002 and 2012. As shown, Turkey's exports are mainly financed via post-shipment methods (exporter finance), the riskiest method of payment. OA terms counts for 58% and CAD terms counts for 19% on average over the years of the sample.[19] This finding is in line with the prediction of Schmidt-Eisenlohr's (2013) model that exports to importers located in countries with strong contract enforcement is more likely to occur on OA terms, given the fact that Turkey's exports are still heavily concentrated on European markets where contracts are more effectively enforced by courts, as compared to Turkey.

On the other hand, Figure 1 and 2 show that the use of CIA method dramatically increased in the last decade. In terms of its share in all methods of payments, CIA method increased almost fivefold. In 2012, more than 20 billion dollars of Turkish exports were executed via CIA compared to 500 million dollars in 2002. The change in the share of CIA sales appears more remarkable when compared to the 10% increase in the share of OA sales for the same time period. The growing share of CIA method in Turkish exports is likely due to the reorientation of Turkey's exports towards faster growing non-traditional markets (such as the Middle East and Africa) where the financial system is under-developed and contract enforcement is weak.

We turn next to the comparison of payment methods for different country groups. As shown in Table 1, CIA method was mostly preferred when trading with Asian, Middle Eastern and Low-income countries, which is consistent with Love (2013) which suggests that

[19] The calculated shares are very similar to those reported in Malouche (2009b), in which the share of CAD and cash against goods (OA) accounts for around 80 percent of exports over the period between January 2008 and December 2009.

the CIA terms are most often used when trading partners are located in low-income countries. The change in the share of CIA terms is around 150% for low income countries and around 600 % for Middle Eastern countries over the years of our sample. In 2012, the share of CIA transactions increased from 9.2 to 35.4 percent in Middle Eastern countries.[20] This change stands out as the largest change in the pattern of trade finance in terms of regional comparisons of all payment methods. In terms of the L/C transactions, Asian, African and Middle Eastern countries rank the top 3 for this method.[21] For the EU-zone countries as well as other developed countries, OA terms dominate the transactions. Figure 5 shows that more than 70% of total exports to Europe and 65% of total exports to rich countries occurred under OA terms in 2012.[22]. This also provides a preview of our empirical results in line with the contractual enforcement hypothesis.

We also reported the share of each trade finance method for different technology intensity of the industries in Table 1 and Figure 4. Medium-low technology industries represent the largest share in terms of pre-payment transactions, whereas high-tech industries represent the largest share in terms of post-shipment terms. This evidence seems to be consistent with the explanation suggested by Menichini (2009) for the role of traded goods characteristics on the payment choice: firms producing vertically differentiated high quality goods may offer more trade credit (OA) to their trading partners than firms producing standardized goods.[23] The industry data also suggests that medium-low technology industries rely more heavily on L/C than other industries. Relatively higher share of L/C observed in these industries shows that the non-traditional markets, particularly Asian, African and Middle Eastern countries, have become increasingly important markets for medium quality Turkish products in recent years.

[20] See Figure 5.

[21] This finding is also observed in BIS (2014), which show that the Asia-Pacific region relies most heavily on L/C. The literature has identified several factors accountable for the higher usage of intermediated trade finance (L/C): longer distances between trading partners, newly formed trade relationships, weak enforcement of international contracts and under-developed banking sectors (Glady and Potin, 2011). In addition to these factors, in the context of Asia historical preferences, legal frameworks, regulatory differences as well as relatively cheap L/C fees are proposed (BIS, 2014).

[22] The similar patterns were also noted in Love (2013).

[23] For additional discussion and empirical evidence on the inter-firm credit relationship, see Ng et al. (1999), Cunat (2007), Giannetti et al. (2011) and Love (2013).

Table 2, on the other hand, documents the changes in shares of methods of payments due to 2008-2009 crises. While Turkey's manufacturing exports fell drastically by 23.15 percent during the crisis, the share of the CIA was surprisingly increased by around 24 percent.[24] This means that Turkish exporters started to use more CIA, the safest method of payment, during the crisis. Perhaps, the most striking point in Table 2 is the large increase in CIA transactions for Middle Eastern countries after the crises. Turkish exporters preferred this method mostly because of the loss in confidence to the contract enforcement in these countries as this period coincides with political instability in the region. This shift towards the CIA method when trading with the Middle Eastern countries also had a large negative impact on the volume of trade.[25] Table 3 shows that Turkey's total exports to the Middle Eastern countries was decreased by 27.5 % after the global recession. This point can also partially explain the deflection of trade to the African countries after the crisis.[26]

Another interesting fact observed from the industry data is that the use of L/C in international transactions decreased in the post-crises era.[27] This finding is not surprising given the fact that the L/C fees increased substantially because of the worldwide financial meltdown. In fact, the share of the use of L/C was decreased by around 30% shortly after the global recession in 2008 (Table 2).[28] A sharper decrease (48%) is observed in L/C transactions for the exports to the developed countries. The largest decline in the growth rate of exports after the global recession was also observed for the exports to the developed countries (Table 3). Not surprisingly, as shown in Figure 1, overall Turkish exports experience a sharp decline in 2008-2009 period, but recovers in 3 years following the crisis.

[24] This finding is broadly consistent with the findings reported in Eck (2012) who documents a rising importance of CIA method relative to the pure bank financing for a sample of European and Central Asian firms during the crisis.
[25] It is important to bear in mind that several empirical studies including Bricongne et al., 2012 and Behrens et al., 2013 suggest that contraction in trade finance was not main driver behind the 2008-2009 trade collapse; rather, the collapse of aggregate demand and the decline in commodity prices were the leading causes of the sharp decline in trade.
[26] Table 3 shows a large increase in the share of exports to the African countries.
[27] Malouche (2009a) also found that the value of L/C issued by the Turkish banking sector declined by 25 percent between September and December 2008.
[28] BIS (2014) documents that the share of L/C in Turkish total exports has dropped from around 26 percent in 1998 to 15 percent in 2012 and suggest that the expanding network of long-term trade relationships reduces the need for L/C in Turkey over time.

In sum, there are four main observations which are suggested by the raw data before proceeding to the formal econometric analysis. First, OA terms dominate the cross border transactions in terms of exports. Second, although pre-payment terms represent a smaller share, their share is on the rise dramatically. Third, pre-payment terms were mostly used when trading with Asian, Middle Eastern and Low-income countries but post-shipment terms were preferred when trading with developed world. Last but not the least, the share of the use of L/C transactions decreased substantially shortly after the global recession in 2008.

3. Empirical analysis

While Schmidt-Eisenlohr's (2013) model is quite successful in explaining stylized facts regarding the usage of payment methods in Turkey, a more careful empirical analysis is needed to assess the role of contract enforcement and financial costs on the payment choice. In order to quantify the effect of contract enforcement and financial cost of trading partners on different payment choices, we estimate the following models:

$$PS_{iht} = \beta_1 + \beta_2 ENF_{jt} + \beta_3 FIN_{jt} + \beta_4 ENF_{it} + \beta_5 FIN_{it} + z_{it} + \vartheta_j + \vartheta_h + \vartheta_t + \varepsilon_{iht} \quad (1)$$

$$PP_{iht} = \gamma_1 + \gamma_2 ENF_{jt} + \gamma_3 FIN_{jt} + \gamma_4 ENF_{it} + \gamma_5 FIN_{it} + z_{it} + \vartheta_j + \vartheta_h + \vartheta_t + \varepsilon_{iht} \quad (2)$$

where *i* denotes the exporting country, *h* denotes the industry at 2-digit level of ISIC Revision 3, *j* denotes the importing country, *t* denotes time in years, PS_{iht} and PP_{iht} represent the share of exports occurred under post-shipment terms and pre-payment terms, respectively. OA and CAD are classified as post-shipment, whereas CIA and L/C is classified as pre-payment term.[29]

ENF_{jt} is the contract enforcement in export destination (importing country) and ENF_{it} denotes the contract enforcement in Turkey (exporting country). Similarly, FIN_{jt} and FIN_{it} denotes the financing costs in the export destination (importing country) and Turkey

[29] The approach adopted in this paper is slightly different from that of Antras and Foley (2003) in which OA and documentary collection (CAD) are considered as post- shipment terms while CIA as pre-payment terms. Although they argue that the choice between L/C terms and post-shipment terms should be similar to the choice between CIA and post-shipment terms in the theoretical part of the paper, they conduct separate regressions for L/C and CIA in the empirical part of the paper. Our results are insensitive to treating only OA as post-shipment and only CIA as pre-payment term.

(exporting country), respectively. Contract enforcement is measured by the rule of law index. Financing costs are measured by net interest margin and private credit over GDP in different specifications.[30]

Many country-level factors can affect the payment choice in international transactions such as the distance between trading partners, cultural ties and trade agreements. Moreover, some industry characteristics or product features (complexity, technology intensity) might also affect the particular trade relationship in terms of payment choice. Therefore, in order to control for country and industry level heterogeneity, we include ϑ_j as the import country effects (export market fixed effects) and ϑ_h as the industry fixed effects. For the aggregate variations in Turkey such as business cycle and current account shocks, we used time fixed effects, ϑ_t.

The testable implication of the Schmidt-Eisenlohr (2013) model is that β_2 and β_3 are positive. The share of post-shipment use in exports is predicted to increase in the enforcement of the destination country, since enforcement takes place there in such a transaction. In addition, firms have less ability to obtain credit with higher financing costs in the buyer's country; and thus Turkish exporters' likelihood of offering post-shipment transactions increases in such a situation.

On the other hand, an improvement in contract enforcement in Turkey makes post-shipment terms less attractive to the buyer. Moreover, higher financing costs in Turkey is predicted to decrease the share of exports occurred under post-shipment terms given the fact that the ability of the exporting firms to finance the transaction weakens with higher financing costs. Consequently, we expect a negative sign for β_4 and β_5.

When it comes to equation (2), the signs of the coefficients are predicted to be the exact opposite of their counterparts in equation (1). Everything else equal, a variable which affects the share of post-shipment transactions positively, affects the pre-payment transactions negatively. Therefore, we expect a negative sign for γ_2, γ_3 and a positive sign for $\gamma_4$and γ_5.

[30] Notice that the expected signs for net interest margin and private credit over GDP are opposite.

Another crucial factor that can affect the choice of payments in global trade is the trust between trading partners. Established trading relationships decrease the risk of asymmetric information; and thus riskier method of payments can be tolerated as the relationship develops. For this consideration, we included "the number of different products exported within the same industry at the year $t-1$" to our model.[31] We believe that industries which export more products to a particular export destination, gathers better information about the market and develops a certain level of trust. In addition, firms in the same industry are often connected via unions, trade associations, and other business organizations and more information is shared within the industry as more products are shipped to a particular export market. As a result, this variable should positively affect the likelihood of observing more post-shipment, less pre-payment transactions.

The analysis also uses two other country level factors. Since contractual enforcement is better in developed countries, we include the logarithm of GDP per capita of both trading partners to ensure that the rule of law does not pick up the effect of the income of the countries.[32] Second, we also used exchange rate between the two countries. Besides the risk of default and non-delivery, firms that trade internationally are also exposed to exchange rate risk. The exchange rate could change between the time of entering the contract and the actual payment for goods involved. For instance, an exporter loses profits in terms of domestic currency in the event of an appreciation of the exporter's currency if it is not properly protected from loss. In order to sustain profitability and cash flow from exchange rate fluctuations, exporters may require importers to prepay for goods shipped. [33] As a result, the exporter prefers using pre-payment terms as opposed to post-shipment terms whenever the Turkish Lira appreciates. Both the GDP per capita and the exchange rate are hence predicted to be positive in equation (1), but negative in equation (2).[34]

[31] We take the logarithm of this variable.
[32] See Antras and Foley (2013).
[33] Other than prepayment, the exchange rate risk can be also managed in various ways such as forward contracts and currency options. However, these hedging techniques are typically not available or too expensive in most developing countries (See Auboin and Meier-Ewert, 2003).
[34] An increase in Exchange rate variable shows a depreciation in Turkish Lira.

4. Results

We begin presenting our results in Table 4.[35] Each specification is estimated via OLS using industry and importer fixed effects and standard errors are clustered for importer-industry combinations. The dependent variable is the share of exports executed under post-shipment terms in a particular industry in Turkey. The financing costs are measured by net interest margin in this table. The first specification reports the estimates with only the enforcement and net interest margin in the importing country. In the second specification, we include exporting country contract enforcement and financing costs as well. Finally, the last specification includes the other control variables.

The contract enforcement and net interest margin both in the importing and exporting country are shown significant in Table 4. In accordance with the contract enforcement hypothesis, coefficient estimates suggest that an improvement in the enforcement in the importing country (exporting country) increases (decreases) the post-shipment sales. To gauge economic significance, consider a standard deviation increase in the enforcement in the importing country based on specification 3. Such an increase will have a marginal effect of 0.043 to the share of post-shipment exports. This change in the enforcement in the importing country corresponds to 6 billion US dollar of exports over the years of our sample.

Table 4 also suggests a significant positive effect of the financing costs in the importing country and a negative effect of the financing costs in the exporting country on the share of post-shipment transactions. In terms of the magnitude of the effect, the estimations in specification 3 suggests that a 1% increase in the net interest margin of the importing country increases the net interest margin by 0.003%. If an importing country at the 25 percentile in net interest margin moves to 75th percentile, the share of post-shipment sales will increase by 0.01% by such a change.

In Table 5, we document the estimates of the payment choice model where the net interest margin is replaced by private credit over GDP to proxy financial costs. Since the

[35] Table A1 shows the summary statistics of the final data. We have around 34000 observations for the baseline regression for over 200 export destinations.

increase in private credit over GDP is associated with a decrease in the financing costs, the signs of the estimates are reversed for this variable. As shown, our results are insensitive to the measure we use for financing costs. In both models, we obtain strong support for the payment choice model.

In addition to all these points, the results in both tables suggest the effect of past trading relationships on the methods of payments. We believe that, more firms are engaging in international trade if more products are shipped within the same industry; and this helps the firms in two different countries overcome the informational barriers associated with the transaction. As the importer and exporter develop a trading relationship, transactions are less likely to be executed under pre-payment terms.[36] Therefore, we hypothesized that the share of post-shipment sales should increase with the number of products exported in the previous year within the same industry. This hypothesis is strongly supported with the coefficient estimates both in Table 4 and Table 5. The importance of this variable is also observed with its marginal effect equivalent to a standard deviation increase in the contract enforcement in the importing country. The coefficient estimates show that a 1% increase in the number of exported products within the same industry in the previous year (stronger trading relations) is associated with around 0.04 % increase in the share of post-shipment sales in Turkish exports.

Having reported the estimates on the share of post-shipment sales, we move to the results of the payment choice model where we used the share of pre-payment transactions. Table 6 shows the results where the financing costs are proxied by net interest margin. Consistent with our predictions, the signs of the coefficient estimates are reversed as compared to Table 4. Although the variables denoting the financing costs and contract enforcement in Turkey falls short of being significant, the variables denoting them in the importing country is shown significant across specifications. The negative coefficient on the contract enforcement in the importing country indicates that Turkish exporters use pre-payment terms less frequently than post-shipment when serving the markets where there is greater confidence in the legal system. In terms of the financing costs, the negative

[36] See Antras and Foley (2013).

coefficient on the net interest margin suggests that higher financing costs in the buyers' country decreases the share of pre-payment sales given the fact that such an effect makes it harder for them to obtain credit to finance the transaction.

The estimated effect between the number of products exported in the previous year and the share of pre-payment sales in exports is also telling in Table 6. As opposed to the post-payment sales, we observe a negative sign for this variable. As the number of trade transactions increase, it is less likely to observe pre-payment terms and thus the share of the pre-payment sales decreases.

Table 7 demonstrates the regression estimates for equation (2) when the private credit over GDP is used for financial conditions. The results are similar to the earlier estimates. The third specification in Table (7) provides significant estimate for the contract enforcement in the exporting country as well. All of the coefficients have the expected sign. Taken together, our results are insensitive to the choice of the financing costs variable and the dependent variable we use. Both for the pre-payment and post-shipment estimates, we obtain strong support for the Schmidt-Eisenlohr (2013) model.

Another notable point to highlight in our estimations is the effect of exchange rate on the method of payments. Although GDP per capita does not show a significant impact, the effect of exchange rate is significant across specifications in all of the tables. In terms of the effect of the exchange rate on different payment terms, our results suggest that the depreciation of Turkish Lira increases the share of post-shipment sales whereas decreases the share of pre-payment ones, as expected. The results further point out that depreciation of Turkish Lira has increased the Turkish exporters' competitiveness in the international market, which improves their ability to extend credit to their trading partners.

5. Conclusion

Trade finance is a vital element of global trade and more than 90% of international transactions are buttressed by some form of financing. Survey evidence suggests that the dramatic slowdown in international trade after the global recession was partly due to the increase in the cost of obtaining credit to finance the transactions. Consequently, the effect of

trade finance on global trade flows has been attracting increasing attention from both scholars and policy makers of late.

Whether the financing conditions in the source country affects the export flows has been widely examined in the literature, but, empirical works analyzing what type of financing methods are used to execute international transactions and how the conditions in both importer's and exporter's country affect these payment choice are scarce. The main challenge for the scholars is the availability of reliable and comprehensive dataset on the usage of different payment methods. Attempts to understand the choice between different payment methods may provide useful information to policymakers in formulating effective and timely measures in times of crisis. In this regard, we represent the first attempt to analyze the payment choice in global trade using a novel bilateral trade data at the 2-digit industry level from Turkey.

Using actual data on the method of payments in international transactions, our formal econometric analysis directly tests the Schmidt-Eisenlohr's (2013) theoretical implications. Our findings suggest that an improvement in the enforcement and an increase in the financing costs in the importing country (exporting country) increases (decreases) the share of sales occurred under post-shipment terms. For the share of pre-payment sales, the opposite effects are estimated for the enforcement and financing costs.

Our findings further suggest a relationship between past trading relationships and the method of payments in international trade. Transactions are more likely to be executed under post-shipment terms as firms develop trading relationships. Measuring the past trading relationship with the number of products traded within the same industry in the previous year, we show that the share of post-shipment sales increases and pre-payment sales decreases when the number of products traded between partners increases over the previous year. This shows the importance of building trust in terms of choosing the appropriate payment method.

There are some conclusions emerging from looking at the raw data as well. We first observed that Turkey's exports are mainly financed via OA. Although pre-payment terms

represent a smaller share, their share is on the rise dramatically. Numerically speaking, the share of CIA transactions was increased by more than 300% between 2002 and 2012. In addition, pre-payment terms were mostly used when trading with Asian, Middle Eastern and Low-income countries but post-shipment terms were preferred when trading with developed world. Furthermore, the share of the use of the L/C transactions in Turkey's exports decreased substantially shortly after the global recession in 2008.

There are several avenues for future research in this area using disaggregated payment contract data. For instance, it would be interesting to study the effect of trade policy on the method of payments in international transactions. Many countries liberalize their trade via trade agreements. Analyzing the impact of these integrations on the usage of trade finance methods can be fruitful. In addition, the shift in the method of payments can impose a restriction to the trading partners and one can test whether this restriction affect the survival of trading relationships in the international market. Different payment methods can also affect the intensive and extensive margin of trade. Finally, the effect of business cycles, financial crisis, and current account and exchange rate shocks on the payment choice is still a question to explore further.

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Appendix

Table A1. Classification of manufacturing industries based on technology

Industries	**ISIC Rev. 3**
High-technology industries	
Aircraft and spacecraft	353
Pharmaceuticals	2423
Office, accounting and computing machinery	30
Radio, TV and communications equipment	32
Medical, precision and optical instruments	33
Medium-high-technology industries	
Electrical machinery and apparatus, n.e.c	31
Motor vehicles, trailers and semi-trailers	34
Chemicals excluding pharmaceuticals	24 excl. 2423
Railroad equipment and transport equipment, n.e.c	352+359
Machinery and equipment, n.e.c	29
Medium-low-technology industries	
Building and repairing of ships and boats	351
Rubber and plastic products	25
Coke, refined petroleum products and nuclear fuel	23
Other non-metallic mineral products	26
Basic metals and fabricated metal products	27-28
Low-technology industries	
Manufacturing, n.e.c., Recycling	36-37
Wood, pulp, paper products, printing and publishing	20-22
Food products, beverages and tobacco	15-16
Textiles, textile products, leather and footwear	17-19
Total manufacturing	15-37

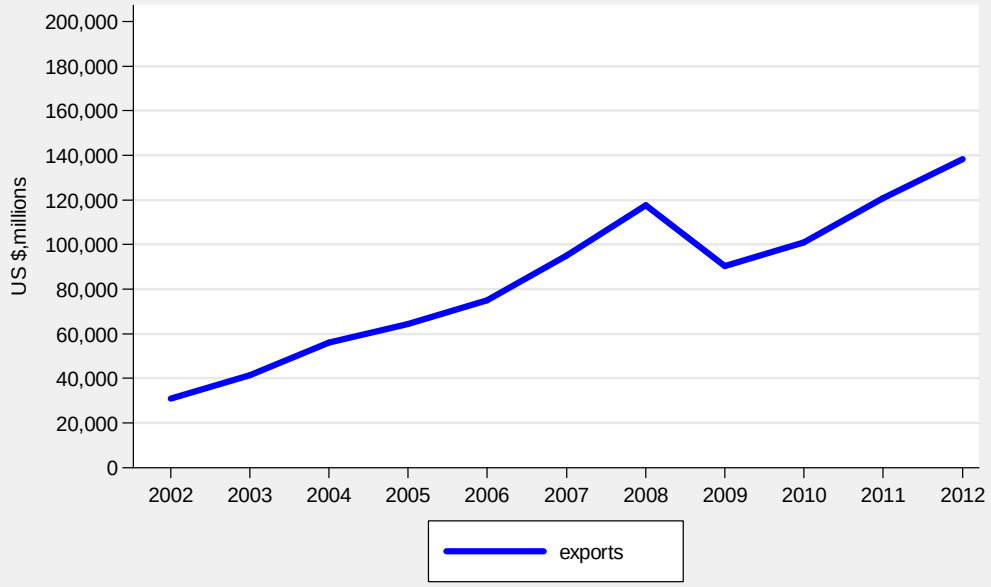
Source: OECD: ANBERD and STAN databases, May 2003

Table A2. Summary Statistics

Variables	**Mean**	**Standard Deviation**
Enforcement in the Importing Country	-0.057	1.002
Net Interest Margin in the Importing Country	4.826	3.050
Enforcement in Exporting Country	0.076	0.060
Net Interest Margin in Exporting Country	5.918	2.388
Private Credit in Exporting Country	25.479	10.112
Private Credit in the Importing Country	50.129	48.681
GDP per capita of the Importing Country*	8.136	1.622
GDP per capita of the Exporting Country	8.918	0.093
Exchange Rate	1.484	0.145
# of exported products exported in *h* at *t-1**	1.840	1.795

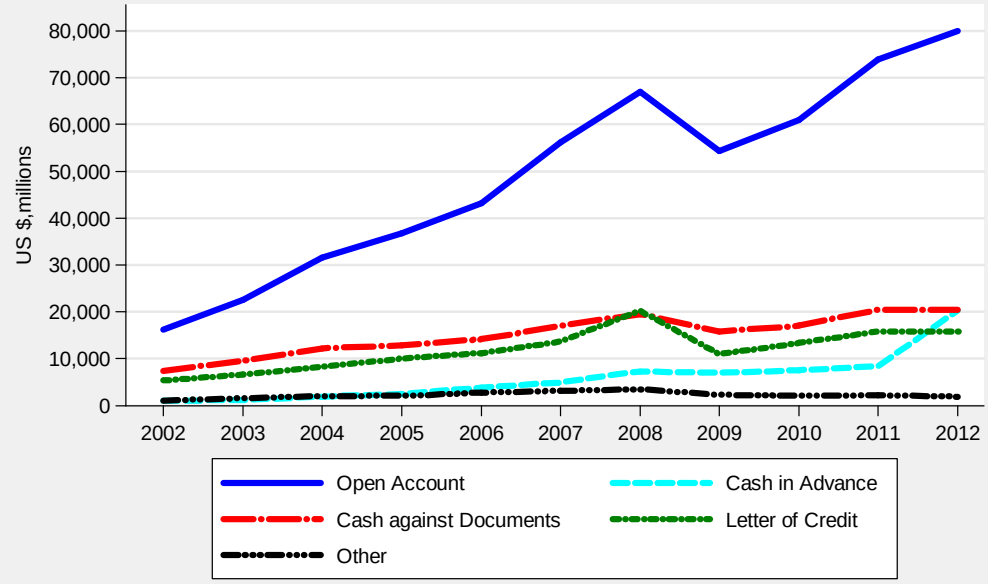
Notes: * this variable is in logs. *h* denotes industry at the 2-digit level.

Figure 1 Turkey's export in manufactured goods (in million of US dollars, 2002-2012)



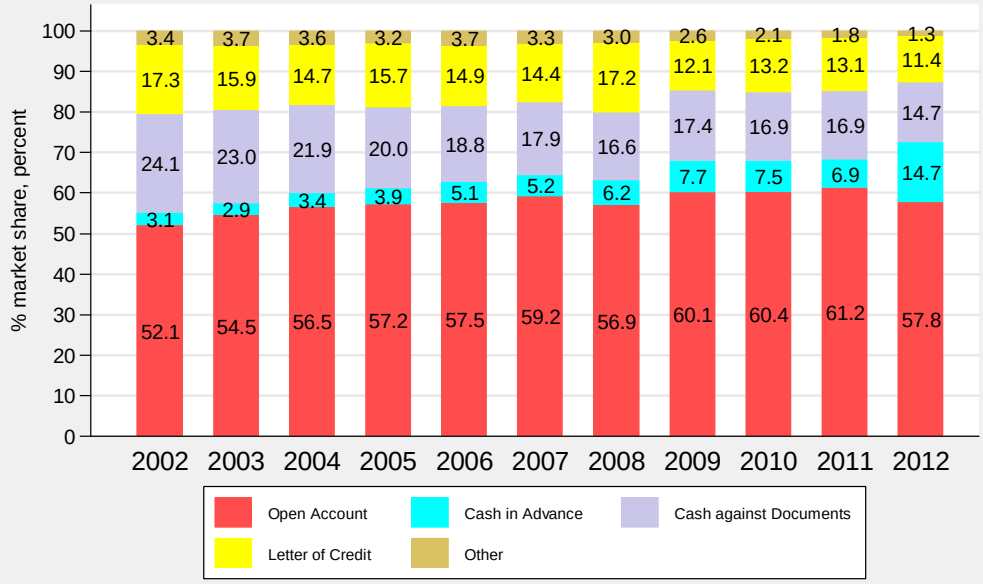
Source: TURKSTAT

Figure 2 Exports by Methods of Payments (in million of US dollars, 2002-2012)



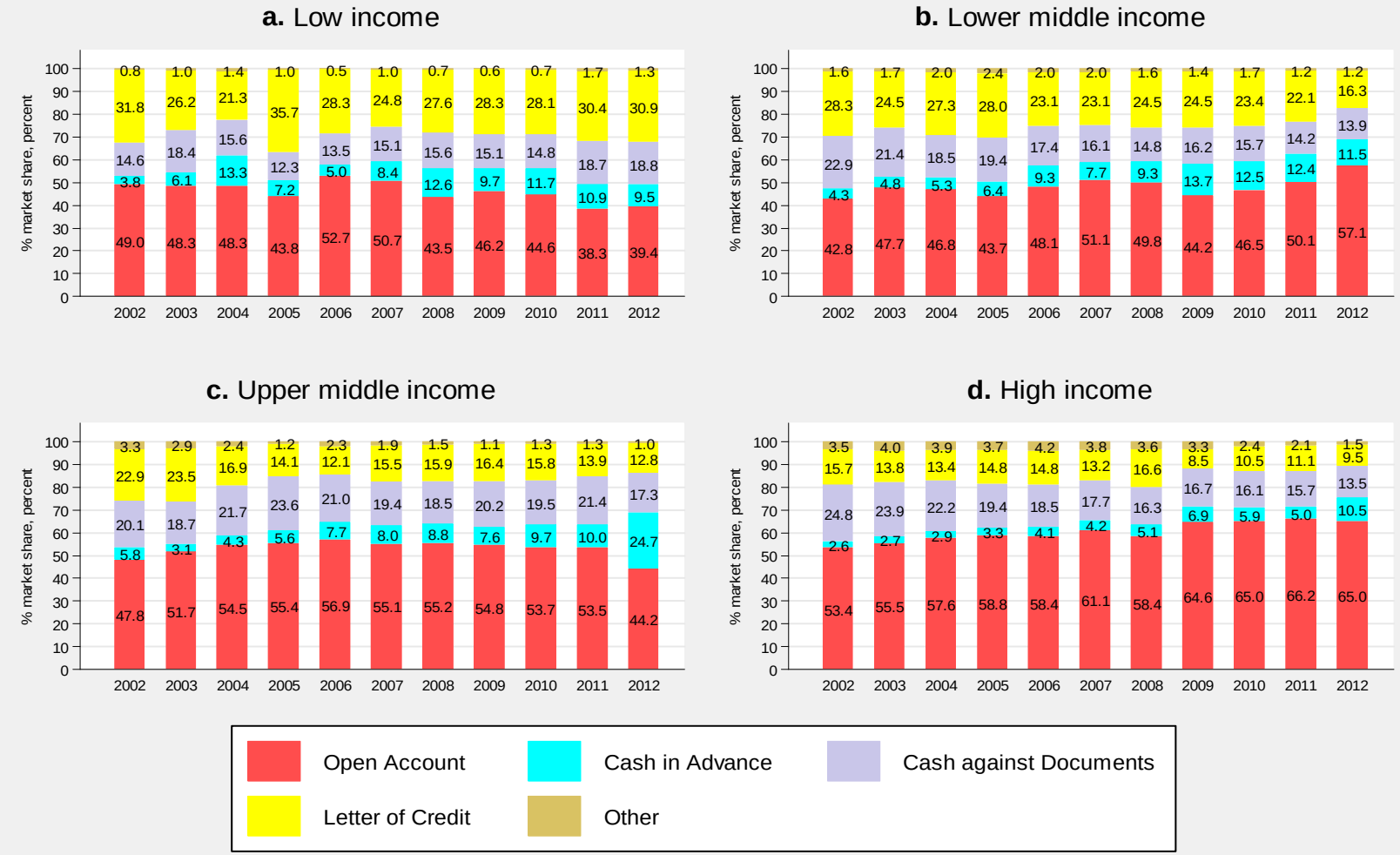
Source: TURKSTAT

Figure 3 Share of Methods of Payments in Exports (in percent, 2002-2012)



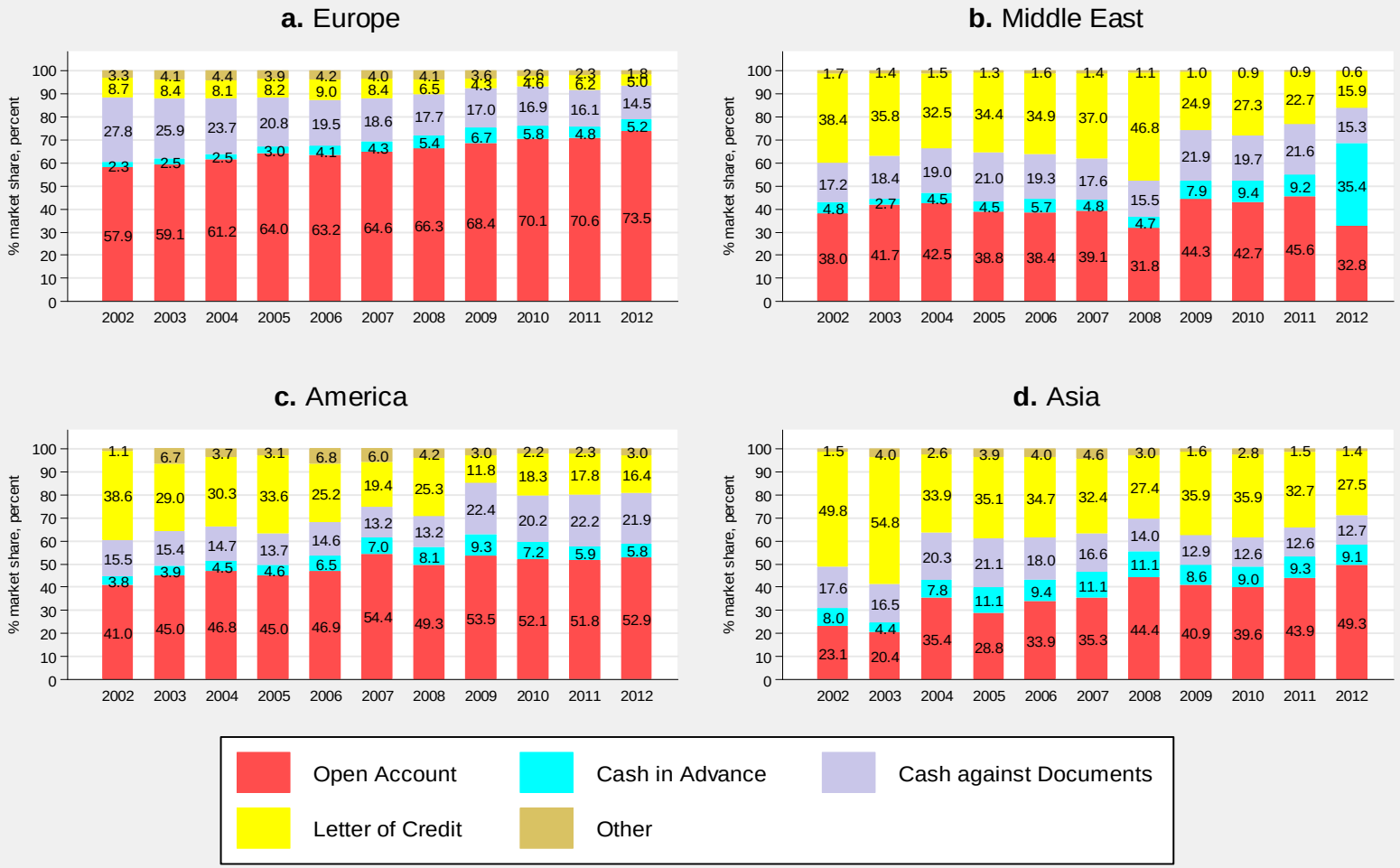
Source: TURKSTAT

Figure 4 Shares of Methods of Payments in Exports by Income level (in percent, 2002-2012)



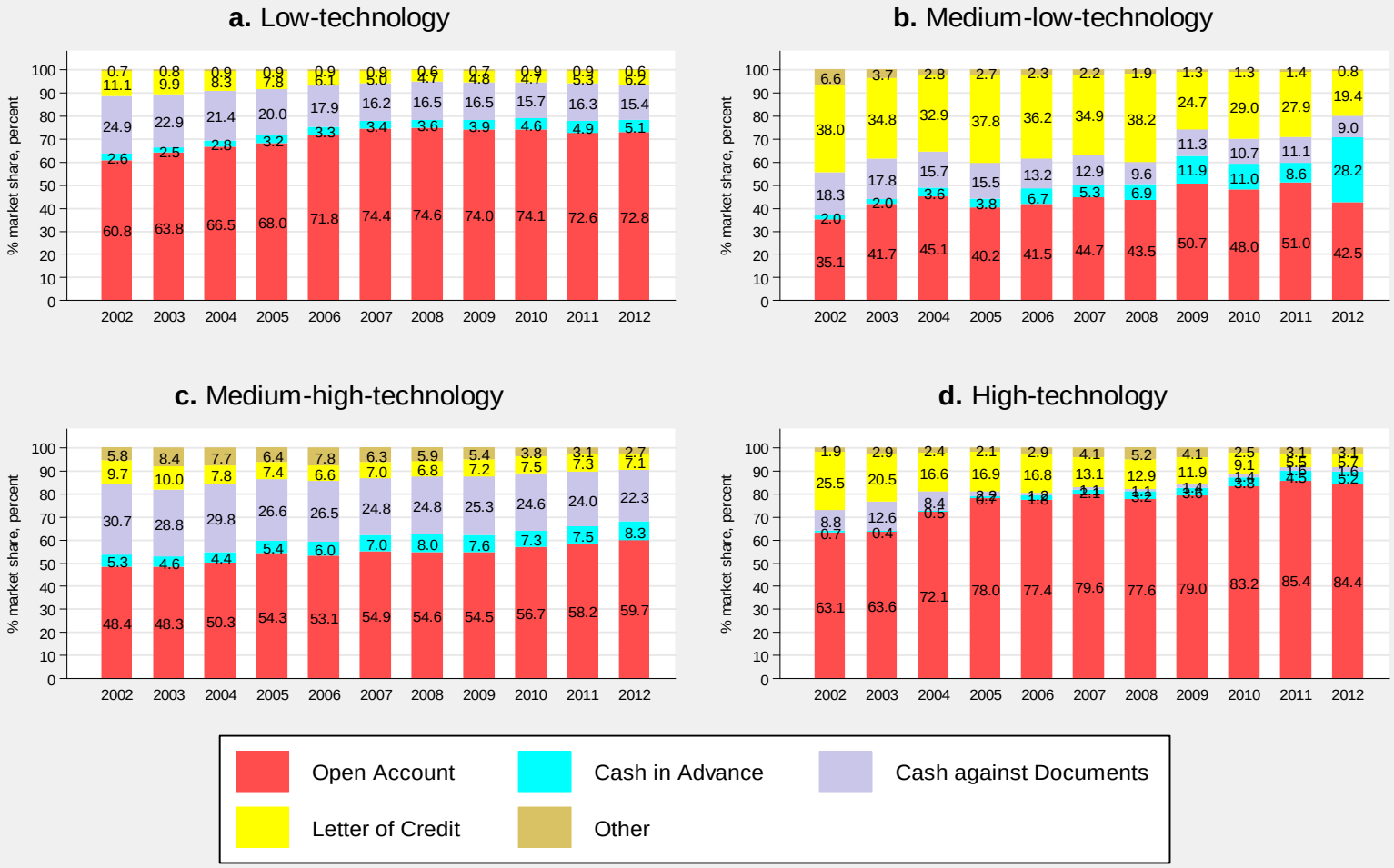
Source: TURKSTAT

Figure 5 Shares of Methods of Payments in Exports by Region (in percent, 2002-2012)



Source: TURKSTAT

Figure 6 Shares of Methods of Payments in Exports by Technological Intensity (in percent, 2002-2012)



Source: TURKSTAT

Table 1: Average usage of methods of payments in Turkey's exports by income, region and industry group, (in percent, 2002-2012)

Sample	OA	CIA	CAD	L/C	Other
Low income	45.91	8.92	15.69	28.49	0.99
Lower middle income	48.00	8.85	17.32	24.11	1.72
Upper middle income	52.99	8.68	20.14	16.34	1.85
High income	60.37	4.83	18.61	12.90	3.28
Europe	65.36	4.23	19.88	7.04	3.48
America	48.98	6.05	17.01	24.15	3.81
Asia	35.92	8.99	15.90	36.39	2.81
Middle East	39.60	8.51	18.78	31.88	1.23
Africa	39.78	6.49	20.69	32.03	1.00
Low-technology	70.31	3.65	18.52	6.72	0.79
Medium-low-tech	44.02	8.18	13.18	32.16	2.46
Medium-high-tech	53.90	6.48	26.20	7.68	5.75
High-tech	76.67	2.42	3.77	14.04	3.11
Overall	57.59	6.06	18.94	14.54	2.87

Source: TURKSTAT

Table 2: Changes in shares of methods of payments in exports due to 2008-2009 crisis by income, region and industry group, (in percent, 2009 vs. 2008)

Sample	OA	CIA	CAD	L/C	Other
Low income	6.29	-22.58	-3.01	2.39	-12.27
Lower middle income	-11.29	47.88	9.12	0.17	-12.11
Upper middle income	-0.75	-14.27	8.63	3.04	-27.05
High income	10.62	35.20	2.34	-48.85	-7.14
Europe	3.21	22.57	-4.05	-33.58	-10.91
America	8.52	15.06	70.30	-53.37	-28.05
Asia	-7.86	-22.67	-7.67	30.92	-46.11
Middle East	39.01	67.94	41.72	-46.91	-10.32
Africa	-4.00	33.37	0.20	-1.71	-25.11
Low-technology	-0.82	10.91	0.04	1.66	24.20
Medium-low-tech	16.71	73.93	17.99	-35.40	-27.96
Medium-high-tech	-0.12	-4.73	1.92	7.15	-8.73
High-tech	1.81	13.07	19.91	-7.39	-21.30
Overall	5.63	23.72	4.80	-29.53	-13.38

Source: TURKSTAT

Table 3. Changes in value and shares of Turkey's exports by income, region and industry group, (2009 vs. 2008)

Sample	Value ($ millions)			Share (%)		
	2008	**2009**	**Change (%)**	**2008**	**2009**	**Change (%)**
Low income	1,432	1,421	-0.77	1.22	1.57	29.12
Lower middle income	9,023	8,353	-7.43	7.68	9.25	20.46
Upper middle income	23,145	21,100	-8.84	19.69	23.36	18.63
High income	83,941	59,456	-29.17	71.41	65.82	-7.83
Europe	64,798	49,495	-23.62	55.13	54.79	-0.61
America	6,255	4,567	-26.98	5.32	5.06	-4.98
Asia	4,062	3,594	-11.53	3.46	3.98	15.13
Middle East	22,193	16,081	-27.54	18.88	17.80	-5.71
Africa	7,480	8,874	18.63	6.36	9.82	54.36
Low-tech	33,251	28,727	-13.61	28.29	31.80	12.42
Medium-low-tech	40,681	28,707	-29.43	34.61	31.78	-8.17
Medium-high-tech	40,901	30,589	-25.21	34.80	33.86	-2.68
High-tech	2,709	2,307	-14.84	2.30	2.55	10.81

Source: TURKSTAT

Table 4. Regression Estimates for Post-Shipment Terms

Dependent variable: Share of exports executed under post-shipment terms in industry *h*

	(1)	(2)	(3)
Enforcement in the Importing Country	0.0673***	0.0639***	0.0430**
	(4.15)	(3.99)	(2.78)
Net Interest Margin in the Importing Country	0.00197**	0.00297**	0.00366**
	(2.50)	(2.27)	(2.74)
Enforcement in the Exporting Country		-0.358***	-0.298***
		(-8.50)	(-6.22)
Net Interest Margin in the Exporting Country		-0.0681***	-0.00524***
		(10.36)	(-6.88)
GDP per capita of the Importing Country			0.0184
			(0.91)
Exchange Rate			0.0415***
			(2.93)
# of exported products exported in *h* at *t-1*			0.0416**
			(7.97)
Time Effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Export market fixed effects	Yes	Yes	Yes
R-squared	0.18	0.40	0.41
Observations	34506	34506	33362

Notes: 1) *h* denotes industry (International Standard Industrial Classification of All Economic Activities (ISIC, Revision 3) at the 2-digit level.) Enforcement is proxied by rule of law index. Each specification includes a constant that is suppressed. Standard errors are clustered for industry-importing country combinations. t statistics are reported in brackets. ***, **, * denote significance at the 1%, 5% and 10% levels, respectively.

Table 5. Regression Estimates for Post-Shipment Terms

Dependent variable: Share of exports executed under post-shipment terms in industry *h*

	(1)	(2)	(3)
Enforcement in the Importing Country	0.0511**	0.0548**	0.0392**
	(2.97)	(3.23)	(2.38)
Private Credit in the Importing Country	-0.000583***	-0.000683***	-0.000590***
	(3.98)	(-4.29)	(-3.70)
Enforcement in the Exporting Country		-0.0825**	-0.0871**
		(-2.04)	(-2.10)
Private Credit in the Exporting Country		0.00328***	0.00285***
		(12.85)	(8.65)
GDP per capita of the Importing Country			0.0499
			(1.50)
Exchange Rate			0.050007*
			(1.88)
# of exported products exported in *h* at *t-1*			0.0392***
			(6.85)
Time Effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Export market fixed effects	Yes	Yes	Yes
R-squared	0.21	0.38	0.43
Observations	32570	32570	31844

Notes: 1) *h* denotes industry (International Standard Industrial Classification of All Economic Activities (ISIC, Revision 3) at the 2-digit level.) Enforcement is proxied by rule of law index. Each specification includes a constant that is suppressed. Standard errors are clustered for industry-importing country combinations. t statistics are reported in brackets. ***, **, * denote significance at the 1%, 5% and 10% levels, respectively.

Table 6. Regression Estimates for Pre-Payment Terms

Dependent variable: Share of exports executed under pre-payment terms in industry *h*

	(1)	(2)	(3)
Enforcement in the Importing Country	-0.00601***	-0.00625***	-0.0125***
	(-5.40)	(-3.97)	(-7.60)
Net Interest Margin in the Importing Country	-0.000477	-0.000968*	-0.00139**
	(-1.97)	(-2.06)	(-3.27)
Enforcement in the Exporting Country		0.123	0.324
		(0.47)	(0.79)
Net Interest Margin in the Exporting Country		0.00278	0.00672
		(0.44)	(0.45)
GDP per capita of the Importing Country			-0.00645
			(-0.33)
Exchange Rate			-0.0134***
			(-3.96)
# of exported products exported in *h* at *t-1*			-0.00316***
			(-4.74)
Time Effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Export market fixed effects	Yes	Yes	Yes
R-squared	0.12	0.29	0.36
Observations	32526	32526	28500

Notes: 1) *h* denotes industry (International Standard Industrial Classification of All Economic Activities (ISIC, Revision 3) at the 2-digit level.) Enforcement is proxied by rule of law index. Each specification includes a constant that is suppressed. Standard errors are clustered for industry-importing country combinations. t statistics are reported in brackets. ***, **, * denote significance at the 1%, 5% and 10% levels, respectively.

Table 7. Regression Estimates for Pre-Payment Terms

Dependent variable: Share of exports executed under pre-payment terms in industry *h*

	(1)	(2)	(3)
Enforcement in the Importing Country	-0.0147***	-0.00841***	-0.0146***
	(-9.31)	(-5.30)	(-6.49)
Private Credit in the Importing Country	0.000269***	0.000120***	0.0000319**
	(8.49)	(3.73)	(2.88)
Enforcement in the Exporting Country		0.0451***	0.0482*
		(3.40)	(1.88)
Private Credit in the Exporting Country		-0.00249	-0.00250
		(-0.97)	(-0.55)
GDP per capita of the Importing Country			-0.00536
			(-0.31)
Exchange Rate			-0.0492**
			(-2.38)
# of exported products exported in *h* at *t-1*			-0.00371***
			(-4.97)
Time Effects	Yes	Yes	Yes
Industry fixed effects	Yes	Yes	Yes
Export market fixed effects	Yes	Yes	Yes
R-squared	0.12	0.28	0.37
Observations	32526	32526	28500

Notes: 1) *h* denotes industry (International Standard Industrial Classification of All Economic Activities (ISIC, Revision 3) at the 2-digit level.) Enforcement is proxied by rule of law index. Each specification includes a constant that is suppressed. Standard errors are clustered for industry-importing country combinations. t statistics are reported in brackets. ***, **, * denote significance at the 1%, 5% and 10% levels, respectively.